

AMENDMENTS TO THE CLAIMS

Claims 1–38. (Cancelled)

39. (Currently amended) A recording method for recording information to a rewritable information recording medium having at least a first recording layer provided with a first data area having a plurality of first addresses allocated thereto and a second recording layer provided with a second data area having a plurality of second addresses allocated thereto, the plurality of first addresses of the first data area continuously increasing in numerical value in a first direction with respect to a radial position of the recording medium, the plurality of second addresses of the second data area continuously increasing in numerical value in a second direction opposite to the first direction with respect to the radial position, the recording method comprising a step of:

recording end recorded area information to the information recording medium, the end recorded area information including the largest highest address of unrecorded area in the second data area, wherein the end recorded area information identifies a recorded area on the second data area having an end address corresponding to the end address of the second data area.

40. (Currently amended) A recording method for recording information to a rewritable information recording medium having at least a first recording layer provided with a first data area having a plurality of first addresses allocated thereto and a second recording layer provided with a second data area having a plurality of second addresses allocated thereto, the plurality of first addresses of the first data area continuously increasing in numerical value in a first direction with respect to a radial position of the recording medium, the plurality of second addresses of the second data area continuously increasing in numerical value in a second direction opposite to the first direction with respect to the radial position, the recording method comprising a step of:

recording end recorded area information to the information recording medium, the end recorded area information including an address following the largest highest address of unrecorded

area in the second data area, wherein the end recorded area information identifies a recorded area on the second data area having an end address corresponding to the end address of the second data area.

41. (Cancelled)

42. (Currently amended) A recording method for recording information to a rewritable information recording medium having at least a first recording layer provided with a first data area having a plurality of first addresses allocated thereto and a second recording layer provided with a second data area having a plurality of second addresses allocated thereto, the plurality of first addresses of the first data area continuously increasing in numerical value in a first direction with respect to a radial position of the recording medium, the plurality of second addresses of the second data area continuously increasing in numerical value in a second direction opposite to the first direction with respect to the radial position, the recording method comprising a step of:

recording end recorded area information to the information recording medium, the end recorded area information identifying a recorded area on the second data area having an end address corresponding to the end address of the second data area, said recorded area being adjacent an area having the largest highest address among unrecorded area on the second data area, wherein the end recorded area information includes an end address of an area situated at an innermost part of the information recording medium among unrecorded data in the second data.

43. (Cancelled)

44. (Previously presented) A recording method according to claim 42, wherein the end recorded area information includes an address following an end address of an area situated closest to an inner periphery of the information recording medium among unrecorded data in the second data area.

45. (Currently amended) A recording method according to any one of claims 42 or [[to]] 44, wherein the end recorded area information includes pointer information indicating a head address of the second data area.

46. (Currently amended) A recording method according to any one of claims 42, 44 or [[to]] 45, wherein the end recorded area information is information related to an end position of an unrecorded area situated at a position in the second data area that is nearest to the end position of the second data area.

47. (Currently amended) A recording method according to any one of claims 39, 40, 42, or 44 to 46, comprising recording to the information recording medium using by a laser, wherein the first recording layer is located closer to the laser than the second recording layer.

48. (Currently amended) A recording method according to any one of claims 39, 40, 42, or 44 to 47, wherein the first direction is a direction oriented from an inner periphery of the information recording medium to an outer periphery of the information recording medium, wherein the second direction is a direction oriented from the outer periphery of the information recording medium to the inner periphery of the information recording medium.

49. (Currently amended) A recording method according to any one of claims 39, 40, 42, or 44 to 48, comprising recording reference recorded area information to the information recording medium for identifying an area to which data is continuously recorded from a reference position provided in the second data area.

50. (Currently amended) A recording method according to any one of claims 39, 40, 42, or 44 to 49, wherein the first data area and the second data area have logical addresses continuing from a start position of the first data area to an end position of the second data area.

51. (Currently amended) A recording method according to any one of claims 39, 40, 42, or 44 to 50, further comprising recording start recorded area information for identifying an area to

which data is continuously recorded from a start position of a combined data area including the first data area and the second data area.

52. (Previously presented) A recording method according to claim 51, wherein the start recorded area information is information related to an end position of an area to which data is continuously recorded from the start position of the combined data area.

53. (Previously presented) A recording method according to claim 52, wherein the start position of the combined data area is the lowest address of the first data area.

54. (Previously presented) A recording method according to claim 53, wherein the start recorded area information includes information indicative of an end position of an area to which data is continuously recorded from a start position of the first data area in the first recording layer, and information indicative of an end position of an area to which data is continuously recorded from a start position of the second data area in the second recording layer.

55. (Previously presented) A recording method according to any one of claims 51 to 54, further comprising:

recording data for making the information recording medium compatible with a read only memory information recording medium by referring to the start recorded area information and the end recorded area information recorded to the information area of the information recording medium.

56. (Currently amended) An information recording apparatus for recording information to a rewritable information recording medium having at least a first recording layer provided with a first data area having a plurality of first addresses allocated thereto and a second recording layer provided with a second data area having a plurality of second addresses allocated thereto, the plurality of first addresses of the first data area continuously increasing in numerical value in a first direction with respect to a radial position of the recording medium, the plurality of second addresses of the second data area continuously increasing in numerical value in a second direction opposite to

the first direction with respect to the radial position, the information recording apparatus comprising:

a recording part for recording data to a designated recording layer among the recording layers of the information recording medium;

a process apparatus for recording end recorded area information to the information recording medium via the recording part, the end recorded area information including the largest highest address of unrecorded area in the second data area, wherein the end recorded area information is arranged to identify a recorded area on the second data area having an end address corresponding to the end address of the second data area.

57. (Currently amended) An information recording apparatus for recording information to a rewritable information recording medium having at least a first recording layer provided with a first data area having a plurality of first addresses allocated thereto and a second recording layer provided with a second data area having a plurality of second addresses allocated thereto, the plurality of first addresses of the first data area continuously increasing in numerical value in a first direction with respect to a radial position of the recording medium, the plurality of second addresses of the second data area continuously increasing in numerical value in a second direction opposite to the first direction with respect to the radial position, the information recording apparatus comprising:

a recording part for recording data to a designated recording layer among the recording layers of the information recording medium;

a process apparatus for recording end recorded area information to the information recording medium via the recording part, the end recorded area information including an address following the largest highest address of unrecorded area in the second data area, wherein the end recorded area information is arranged to identify a recorded area on the second data area having an end address corresponding to the end address of the second data area.

58. (Cancelled)

59. (Currently amended) An information recording apparatus for recording information to a rewritable information recording medium having at least a first recording layer provided with a first data area having a plurality of first addresses allocated thereto and a second recording layer provided with a second data area having a plurality of second addresses allocated thereto, the plurality of first addresses of the first data area continuously increasing in numerical value in a first direction with respect to a radial position of the recording medium, the plurality of second addresses of the second data area continuously increasing in numerical value in a second direction opposite to the first direction with respect to the radial position, the information recording apparatus comprising:

a recording part for recording data to a designated recording layer among the recording layers of the information recording medium;

a process apparatus for recording end recorded area information to the information recording medium via the recording part, the end recorded area information being for identifying a recorded area on the second data area having an end address corresponding to the end address of the second data area, said recorded area being adjacent an area having the largest highest address among unrecorded area on the second data area, wherein the end recorded area information includes an end address of an area situated at an innermost part of the information recording medium among unrecorded data in the second data.

60. (Cancelled)

61. (Previously presented) Apparatus according to claim 59, wherein the end recorded area information includes an address following an end address of an area situated closest to an inner periphery of the information recording medium among unrecorded data in the second data area.

62. (Currently amended) Apparatus according to any one of claims 59 or[[to]] 61, wherein the end recorded area information includes pointer information indicating a head address of the second data area.

63. (Currently amended) Apparatus according to any one of claims 59,61 or [[to]] 62, wherein the end recorded area information is information related to an end position of an unrecorded area situated at a position in the second data area that is nearest to the end position of the second data area.

64. (Currently amended) Apparatus according to any one of claims 56,57, 59, or 61 to 63, wherein the recording part is adapted to record to the information recording medium using a laser, and the first recording layer is located closer to the laser than the second recording layer.

65. (Currently amended) Apparatus according to any one of claims 56,57, 59, or 61 to 64, wherein the first direction is a direction oriented from an inner periphery of the information recording medium to an outer periphery of the information recording medium, wherein the second direction is a direction oriented from the outer periphery of the information recording medium to the inner periphery of the information recording medium.

66. (Currently amended) Apparatus according to any one of claims 56,57, 59, or 61 to 65, wherein the process apparatus is arranged to record reference recorded area information via the recording part, the record reference recorded area information being for identifying an area to which data is continuously recorded from a reference position provided in the second data area.

67. (Currently amended) Apparatus according to any one of claims 56,57, 59, or 61 to 66, wherein the first data area and the second data area have logical addresses continuing from a start position of the first data area to an end position of the second data area.

68. (Currently amended) Apparatus according to any one of claims 56,57, 59, or 61 to 67, wherein the process apparatus is adapted to record start recorded area information to the information recording medium via the recording part, the start recorded area information including

information being for identifying an area to which data is continuously recorded from a start position of a combined data area including the first data area and the second data area.

69. (Previously presented) Apparatus according to claim 68, wherein the start recorded area information is information related to an end position of an area to which data is continuously recorded from the start position of the combined data area.

70. (Previously presented) Apparatus according to claim 69, wherein the start position of the combined data area is the lowest address of the first data area.

71. (Previously presented) Apparatus according to claim 68, wherein the start recorded area information includes information indicative of an end position of an area to which data is continuously recorded from a start position of the first data area in the first recording layer, and information indicative of an end position of an area to which data is continuously recorded from a start position of the second data area in the second recording layer.

72. (Currently amended) Apparatus according to any one of claims 56, 57, 59, or 61 to 71, wherein the apparatus is arranged such that when dummy data is recorded to the second data area, the end recorded area information is updated in correspondence with the area to which the dummy data is recorded.

73. (Currently amended) Apparatus according to any one of claims 56, 57, 59, or 61 to 72, wherein the process apparatus is further adapted to record data for making the information recording medium compatible with a read only memory information recording medium via the recording part by referring to the start recorded area information and the end recorded area information recorded to the information area of the information recording medium.

74. (Previously presented) Apparatus according to claim 73, wherein when the area identified by the start recorded area information is entirely included in the first data area, the process apparatus is arranged to record dummy data, via the recording part, to an unrecorded area situated between a position in the second data area situated at a same radial position as an end position

identified by the start recorded area information and a start position identified by the end recorded area information.

75. (Previously presented) Apparatus according to claim 73, wherein when the area identified by the start recorded area information is entirely included in the first data area, the process apparatus is arranged to record dummy data, via the recording part, to an unrecorded area situated between a position in the second data area with a bit inverted address as an end position identified by the start recorded area information and a start position identified by the end recorded area information.

76. (Previously presented) Apparatus according to claim 74, wherein the process apparatus is arranged to record a first intermediate area data to an area following the identified area in the first data area via the recording part and to record a second intermediate area data to an area in the second data area situated at a same radial position as the intermediate area in the first data area via the recording part.

77. (Previously presented) Apparatus according to claim 74, wherein the process apparatus is arranged to record a first intermediate area data to an area following the identified area in the first data area via the recording part and to record a second intermediate area data to an area in the second data area situated at the bit inverted address corresponding to the intermediate area in the first data area via the recording part.

78. (Previously presented) Apparatus according to any one of claims 75 to 77, wherein the process apparatus is arranged to obtain identification information including information for identifying an area in the second data area to which user data is recorded.

79. (Previously presented) Apparatus according to claim 78, wherein the identification information further includes information for identifying an unrecorded area in the first data area.

80. (Previously presented) Apparatus according to any one of claims 73 to 79, wherein the process apparatus is further adapted to obtain identification information including information

for identifying an area, following the area identified by the start recorded area information, to which user data is recorded.

81. (Previously presented) Apparatus according to claim 78, wherein when user data is recorded in the area identified by the end recorded area information, the process apparatus is arranged to record dummy data, via the recording part, to an unrecorded area situated between an end position of the area identified by the start recorded area information and a start position of the area identified by the end recorded area information.

82. (Previously presented) Apparatus according to any one of claims 68 to 81, further comprising a formatting part for formatting the information recording medium, wherein the first and second data areas of the first and second recording layers are divided into a plurality of zones, wherein dummy data is recorded to the plural zones via the recording part and the information recording medium is formatted when there is no request for accessing the information recording medium.

83. (Previously presented) Apparatus according to claim 82, wherein the formatting part is arranged to obtain reference recorded area information including information for identifying an area to which data is continuously recorded from a reference position, wherein the reference position is a start position of one of the plural zones, wherein the one of the zones includes an end position of an unrecorded area situated adjacent to an area identified by the end recorded area information.

84. (Previously presented) Apparatus according to claim 82, wherein the start position of each zone is set as a reference position, wherein area information is set in correspondence with the zones for identifying the area to which data is continuously recorded from the reference position, wherein the formatting part obtains the area information of one of zones as reference recorded area information, wherein the one of the zones includes an end position of an unrecorded area situated adjacent to an area identified by the end recorded area information.

85. (Previously presented) Apparatus according to claim 83, wherein in a case of where the formatting part records dummy data to the one of the zones in the second data area, the apparatus is arranged to record dummy data to an unrecorded area situated between an end position of an area identified by the reference recorded area information and a start position of an area identified by the end recorded area information.

86. (Previously presented) Apparatus according to claim 83, wherein the process apparatus is further adapted to record the reference recorded area information to the information recording medium via the recording part.

87. (Previously presented) Apparatus according to claim 82, wherein the first direction of the first data area is a direction oriented from an inner periphery of the information recording medium to an outer periphery of the information recording medium, wherein the second direction of the second data area is a direction oriented from the outer periphery of the information recording medium to the inner periphery of the information recording medium, wherein among the zone including the start position of the unrecorded area adjacent to the area identified by the start recorded area information and the zone including the end position of the unrecorded area adjacent to the area identified by the end recorded area information, the formatting part is adapted to record dummy data from the zones situated toward the inner periphery of the information recording medium in a case where the end position of the area identified by the start recorded area information belongs to the first data area.

88. (Currently amended) A rewritable information recording medium having at least a first recording layer and a second recording layer, the information recording medium comprising:

a first data area situated in the first recording layer, the first data area having a plurality of first addresses allocated thereto, the plurality of first addresses continuously increasing in numerical value in a first direction with respect to a radial position of the recording medium;

a second data area situated in the second recording layer, the second data area having a plurality of second addresses allocated thereto, the plurality of second addresses continuously

increasing in numerical value in a second direction opposite to the first direction with respect to the radial position; and

an information area having an area for recording end recorded area information thereto, the end recorded area information including the largest highest address of unrecorded area in the second data area, wherein the end recorded area information is for identifying a recorded area on the second data area having an end address corresponding to the end address of the second data area.

89. (Currently amended) A rewritable information recording medium having at least a first recording layer and a second recording layer, the information recording medium comprising:

a first data area situated in the first recording layer, the first data area having a plurality of first addresses allocated thereto, the plurality of first addresses continuously increasing in numerical value in a first direction with respect to a radial position of the recording medium;

a second data area situated in the second recording layer, the second data area having a plurality of second addresses allocated thereto, the plurality of second addresses continuously increasing in numerical value in a second direction opposite to the first direction with respect to the radial position; and

an information area having an area for recording end recorded area information thereto, the end recorded area information including an address following the largest highest address of unrecorded area in the second data area, wherein the end recorded area information is for identifying a recorded area on the second data area having an end address corresponding to the end address of the second data area.

90. (Cancelled)

91. (Currently amended) A rewritable information recording medium having at least a first recording layer and a second recording layer, the information recording medium comprising:

a first data area situated in the first recording layer, the first data area having a plurality of first addresses allocated thereto, the plurality of first addresses continuously increasing in numerical value in a first direction with respect to a radial position of the recording medium;

a second data area situated in the second recording layer, the second data area having a plurality of second addresses allocated thereto, the plurality of second addresses continuously increasing in numerical value in a second direction opposite to the first direction with respect to the radial position; and

an information area having an area for recording end recorded area information thereto, the end recorded area information being for identifying a recorded area on the second data area having an end address corresponding to the end address of the second data area, said recorded area being adjacent an area having the largest highest address among unrecorded area on the second data area, wherein the end recorded area information includes an end address of an area situated at an innermost part of the information recording medium among unrecorded data in the second data.

92. (Cancelled)

93. (Previously presented) An information recording medium according to claim 91, wherein the end recorded area information includes an address following an end address of an area situated closest to an inner periphery of the information recording medium among unrecorded data in the second data area.

94. (Currently amended) An information recording medium according to any one of claims 91 or[[to]] 93, wherein the end recorded area information includes pointer information indicating a head address of the second data area.

95. (Currently amended) An information recording medium according to any one of claims 91, 89, 91, 93, or [[to]] 94, wherein the end recorded area information is information related to an end position of an unrecorded area situated at a position in the second data area that is nearest to the end position of the second data area.

96. (Currently amended) An information recording medium according to any one of claims 88, 89, 91, or 93 to 95, wherein the information recording medium is adapted to be read or recorded by a laser, and the first recording layer is located closer to the laser than the second recording layer.

97. (Currently amended) An information recording medium according to any one of claims 88, 89, 91, or 93 to 96, wherein the first direction is a direction oriented from an inner periphery of the information recording medium to an outer periphery of the information recording medium, wherein the second direction is a direction oriented from the outer periphery of the information recording medium to the inner periphery of the information recording medium.

98. (Currently amended) An information recording medium according to any one of claims 88, 89, 91, or 93 to 97, wherein the management information area further includes reference recorded area information for identifying an area to which data is continuously recorded from a reference position provided in the second data area.

99. (Currently amended) An information recording medium according to any one of claims 88, 89, 91, or 93 to 98, wherein the first data area and the second data area have logical addresses continuing from a start position of the first data area to an end position of the second data area.

100. (Currently amended) An information recording medium according to any one of claims 88, 89, 91, or 93 to 99, wherein the information area further includes start recorded area information for identifying an area to which data is continuously recorded from a start position of a combined data area including the first data area and the second data area.

101. (Previously presented) An information recording medium according to claim 100, wherein the start recorded area information is information related to an end position of an area to which data is continuously recorded from the start position of the combined data area.

102. (Previously presented) An information recording medium according to claim 101, wherein the start position of the combined data area is the lowest address of the first data area.

103. (Previously presented) An information recording medium according to claim 100, wherein the start recorded area information includes information indicative of an end position of an area to which data is continuously recorded from a start position of the first data area in the first recording layer, and information indicative of an end position of an area to which data is continuously recorded from a start position of the second data area in the second recording layer.

104. (Currently amended) A data structure of information for being recorded to the information area in the information recording medium in claim 88, the data structure comprising:

end recorded area information including the largest highest address of unrecorded area in the second data area.

105. (Currently amended) A data structure of information for being recorded to the information area in the information recording medium in claim 89, the data structure comprising:

end recorded area information including an address following the largest highest address of unrecorded area in the second data area.

106. (Currently amended) A data structure of information for being recorded to the information area in the information recording medium in claim 91, the data structure comprising:

end recorded area information for identifying a recorded area on the second data area having an end address corresponding to the end address of the second data area, said recorded area being adjacent an area having the largest highest address among unrecorded area on the second data area.

107. (Currently amended) A program for causing a computer of an information recording apparatus to carry out the method of any one of claims 39, 40, 42, or 44 to 55.

108. (Previously presented) A computer readable medium comprising:
the program in claim 107.